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Economic Report

To: Stephen Churchill, Esq.

From: Craig L. Moore, Ph.D.

Date: March 1, 2016

Re: *Christina Corda v. District Attorney's Office of Suffolk County*

Background

Christina Corda is a 33 year old (DOB 3/08/82) female who lives in Boston, Massachusetts. Ms. Corda began working for the Suffolk County District Attorney's Office ("DA's Office") on September 24, 2007 and continued working there until September 22, 2014 when the Suffolk County District Attorney terminated her. Ms. Corda's most recent position was as an Assistant District Attorney (ADA) working in the Gang Unit.

It is my understanding that Ms. Corda began complaining that her salary, as well as the salary of an Afro-American ADA, was relatively low in May of 2014. When she expressed the opinion that these disparities in salary were due to race and gender discrimination, she was terminated.

It is alleged that Ms. Corda's did not receive equal pay to that of males who were similarly situated at the DA's Office. Further, she claims that her termination was the result of retaliation because she voiced these claims of race and gender discrimination.

Assignment

I have been retained to form an opinion to a reasonable degree of economic certainty as to the present value of lost pension benefits resulting from the personnel actions of the DA's Office and their termination of Christina Corda in September of 2014. My analysis does not address the validity of Ms. Corda's claims of discrimination and retaliation, but determines the economic damages arising from the employment actions that transpired without regard to the reasons for those actions by either party. The analysis is explained in detail and all computations are provided in tables in this report.

In preparing this report, I have made the following assumptions about the Massachusetts state retirement system.¹ (1) Ms. Corda would have vested in the state retirement system after 10 years of service with the DA's Office. (2) If Ms. Corda had vested, she would have been eligible to receive pension benefits beginning at age 55. (3) Assistant DA's are in retirement group 4. See Mass. Gen. Laws ch. 32, sec. 3(2)(g). (4) The amount of the pension for an employee in group 4 with 10 years of service is 25% of the average of the three highest years of pay, regardless of when the employee begins to receive pension benefits (that is, whether the employee is 55 or older). With each additional year of service after 10 years, the percentage increases by 2.5%, until maxing out at 80% after 32 years of service (e.g., 27.5% after 11 years, 30% after 12 years, etc.). This is confirmed by the online pension calculator provided by the Commonwealth of Massachusetts. See <http://www.mass.gov/treasury/retirement/for-current-emps/estimate-retirement.html>.

The Basis for Economic Damages

Economic damages are based on the economic concept of *opportunity cost*. If, as a result of an illegal act, a person is deprived of the opportunity to earn a living, the resulting damages are equal to the cost of restoring the injured person's lost opportunity or providing what would have reasonably been the fruits of exercising it. In this case, it is alleged that Christina Corda was deprived of pension benefits that she otherwise would have received had he not been terminated by the DA's Office.

Professional Background and Earnings History

Ms. Corda graduated from Holliston High School in 2000. She attended New York University for a year before transferring to Boston College where she received a Bachelor's degree in 2004. She then entered Suffolk University Law School and graduated in 2007. In the summer of 2007 she passed the bar and became a member of the Massachusetts Legal Bar.

Ms. Corda was hired by the DA's Office on September 24, 2007 as an ADA on the contingency she passed the Bar Exam by the end of January, 2007 at a starting annual salary of \$28,000. Her salary was increased to \$37,500 and then to \$40,000 after being sworn in as an ADA. She remained at that level until September of 2011 when it was increased to \$46,500. In October of 2011 she received an increase to \$47,500. The following year her salary was increased to \$52,000 when she was promoted to the Gang Unit. She also received retention bonuses in several years, including a bonus of \$2,500 in February of 2012. In February of 2014 she received her final raise to \$53,550.

Ms. Corda was hired as an Associate at the law firm of Bretta & Grimaldi in Medford, Massachusetts at a starting salary of \$75,000. She began her new job on November 24, 2014. She is currently employed at this job.

Earnings based on W-2 statements from the DA's Office for the years prior to her termination and for 2015 from her new employer are shown in Table 1.

¹ These are described in detail at <http://www.mass.gov/treasury/retirement/>.

Table 1.

Year	Earnings
2012	52,337.32
2013	55,260.80
2014	44,015.02
2015	62,596.22

Employee Benefits

In addition to wages, Christina Corda's compensation also includes the value of employee benefits. The scope and cost of employee benefits has been increasing steadily as many employees would rather receive these benefits than an increase in wages because they represent non-taxable income. Social Security taxes, state and federal unemployment taxes, Medicare contributions, and Workers Compensation premiums are often cited as employee benefits. They are not. The payments going to support these programs are taxes and the amount paid in does not directly affect the benefits received by the employee.

Ms. Corda did, however, receive a number of benefits from the DA's Office including health insurance, life insurance, paid holidays, paid vacation, a pension program, long-term disability insurance, tuition assistance, and other benefits. At her new job she has no retirement program, she pays \$213.36 per month for health insurance and \$29.50 per month for dental insurance. She has no life insurance or long-term disability coverage.

Work-life and Life Expectancy

An important element in determining the value of future lost earnings is work-life expectancy. First, there are no reliable published estimates of expected work-life in my opinion. The last government figures were published in 1986 and, following several years of criticism, were suspended. Second, economic damages are not based on the expected value of future earnings. They are based on the value of a lost opportunity. The present value of any opportunity is valued at what it would yield if it were exercised to its fullest.

In this case I have assumed that Christina Corda would have continued to work for the DA's Office until she became vested in the state retirement system, which requires ten years of service. At age 55 she would have been eligible to take her retirement benefit based on 25% of the average of her highest three years of salary.

Christina Corda has a life expectancy of 88 years based on Social Security Actuarial Tables.²

Estimating the Present Value of Lost Future Earnings

The determination of the present value of lost future earnings involves two factors. First, one has to determine what the rate of growth would have been in earnings had Christina Corda been afforded the opportunity to continue working for the DA's

² <https://www.socialsecurity.gov/cgi-bin/longevity.cgi>

Office. Second, the estimated loss of future earnings must be reduced to present value over her work-life. To do this it is necessary to calculate how much would have to be invested today to provide those losses in each period that they will occur. The economic background concerning each of these elements of the analysis is described in the following sections in detail.

Rate of Growth in Real Wages

For the purposes of this analysis, I have assumed that Christina Corda's nominal earnings would have increased, at a minimum, at the same rate they did over the four years prior to her termination. The graph next to Table 2 shows her projected salary in each year to age 35 based on this past trend in earnings at the DA's Office. The model accounts for approximately 90% of the total variation in her salary and is statistically significant. As discussed below, I also performed calculations based on higher salary figures.

Present Value

Once the value of lost future earnings has been established, it must be reduced to present value. That is, one must determine how much money would have to be set aside and invested today to provide that future loss in earnings. The only element that is uncertain in calculating the present value is the net rate of return that will be earned on the funds that are invested for future use.

The discount rate used here to determine the present value of future lost earnings is calculated using the yield curve of U.S. Treasury Securities. The current yield for various time horizons (known as the yield curve when it is graphed) is shown below. These are the rates that are used to discount to present value over the corresponding time horizons.³

Treasury Yields

Date	5 year	7 year	10 year	20 year	30 year
2/11/2016	0.17%	0.30%	0.45%	0.81%	1.03%

Present Value of Lost Pension Benefits

The figures in Table 2 show the expected salary for each year in the DA's Office to age 35, when she would have vested in the state retirement system. The first column contains the year in question and the second column shows Christina Corda's age in that year. The third column contains her estimated earnings had she not been terminated. At the bottom of the table the average of the last 3 years of salary is shown. Her pension would equal 25% of that figure given her age and years of service. Thus she could receive \$15,347 each year until her life expectancy.

The figures in Table 3 show the present value of Ms. Corda's lost pension from the date of her retirement through her life expectancy. The pension is assumed to increase each year by the cost of living. The nominal amount of the pension does not change

³ <http://www.federalreserve.gov/releases/h15/data.htm>

because it is then discounted using the TIPS rate for 30 years that guarantees a yield plus the value of inflation across the time horizon of the analysis. The present value of the lost pension benefits would be equal to approximately \$357,114.

If one were to take a more conservative approach and use her 2015 salary as the average of her last 3 years, \$58,227, her pension would be \$14,557. The present value of that pension from age 55 to her life expectancy would be \$338,731. This is shown in Table 4.

If one were to assume that she would have received a significant raise during her last 3 years that gave her an average salary of \$70,000 her pension would have been \$17,500 annually. The present value of this pension benefit from age 55 through her life expectancy would equal approximately \$407,212. This is shown in Table 5 below.

Table 2.

Year	Age	Salary
2007	25	28,000.00
2008	26	37,500.00
2009	27	40,000.00
2010	28	40,000.00
2011	29	46,500.00
2012	30	52,000.00
2013	31	52,000.00
2014	32	53,550.00
2015	33	58,266.67
2016	34	61,388.10
2017	35	64,509.52
Average		61,388.10
Retirement		15,347.02

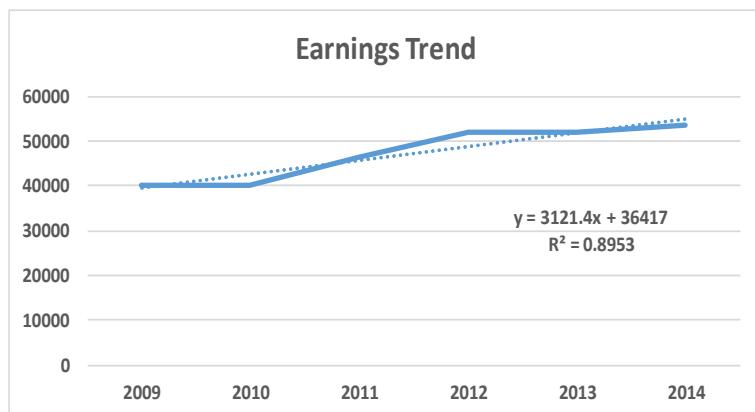


Table 3.

Year	Age	Pension	Present Value
2037	55	15,347.00	12,375.59
2038	56	15,347.00	12,249.43
2039	57	15,347.00	12,124.54
2040	58	15,347.00	12,000.93
2041	59	15,347.00	11,878.58
2042	60	15,347.00	11,757.48
2043	61	15,347.00	11,637.61
2044	62	15,347.00	11,518.97
2045	63	15,347.00	11,401.53
2046	64	15,347.00	11,285.29
2047	65	15,347.00	11,170.24
2048	66	15,347.00	11,056.36
2049	67	15,347.00	10,943.64
2050	68	15,347.00	10,832.07
2051	69	15,347.00	10,721.64
2052	70	15,347.00	10,612.33
2053	71	15,347.00	10,504.14
2054	72	15,347.00	10,397.05
2055	73	15,347.00	10,291.05
2056	74	15,347.00	10,186.13
2057	75	15,347.00	10,082.29
2058	76	15,347.00	9,979.50
2059	77	15,347.00	9,877.76
2060	78	15,347.00	9,777.05
2061	79	15,347.00	9,677.38
2062	80	15,347.00	9,578.72
2063	81	15,347.00	9,481.06
2064	82	15,347.00	9,384.40
2065	83	15,347.00	9,288.73
2066	84	15,347.00	9,194.03
2067	85	15,347.00	9,100.30
2068	86	15,347.00	9,007.52
2069	87	15,347.00	8,915.69
2070	88	15,347.00	8,824.79
Total			357,113.82

Table 4.

Year	Age	Pension	Present Value
2037	55	14,557.00	11,738.55
2038	56	14,557.00	11,618.88
2039	57	14,557.00	11,500.42
2040	58	14,557.00	11,383.17
2041	59	14,557.00	11,267.12
2042	60	14,557.00	11,152.26
2043	61	14,557.00	11,038.56
2044	62	14,557.00	10,926.02
2045	63	14,557.00	10,814.63
2046	64	14,557.00	10,704.37
2047	65	14,557.00	10,595.24
2048	66	14,557.00	10,487.23
2049	67	14,557.00	10,380.31
2050	68	14,557.00	10,274.48
2051	69	14,557.00	10,169.73
2052	70	14,557.00	10,066.05
2053	71	14,557.00	9,963.43
2054	72	14,557.00	9,861.85
2055	73	14,557.00	9,761.31
2056	74	14,557.00	9,661.79
2057	75	14,557.00	9,563.29
2058	76	14,557.00	9,465.79
2059	77	14,557.00	9,369.29
2060	78	14,557.00	9,273.77
2061	79	14,557.00	9,179.22
2062	80	14,557.00	9,085.64
2063	81	14,557.00	8,993.01
2064	82	14,557.00	8,901.33
2065	83	14,557.00	8,810.58
2066	84	14,557.00	8,720.76
2067	85	14,557.00	8,631.85
2068	86	14,557.00	8,543.85
2069	87	14,557.00	8,456.74
2070	88	14,557.00	8,370.53
Total			338,731.08

Table 5.

Year	Age	Pension	Present Value
2037	55	17,500.00	14,111.74
2038	56	17,500.00	13,967.87
2039	57	17,500.00	13,825.47
2040	58	17,500.00	13,684.52
2041	59	17,500.00	13,545.01
2042	60	17,500.00	13,406.92
2043	61	17,500.00	13,270.23
2044	62	17,500.00	13,134.94
2045	63	17,500.00	13,001.03
2046	64	17,500.00	12,868.49
2047	65	17,500.00	12,737.29
2048	66	17,500.00	12,607.44
2049	67	17,500.00	12,478.90
2050	68	17,500.00	12,351.68
2051	69	17,500.00	12,225.76
2052	70	17,500.00	12,101.11
2053	71	17,500.00	11,977.74
2054	72	17,500.00	11,855.63
2055	73	17,500.00	11,734.76
2056	74	17,500.00	11,615.13
2057	75	17,500.00	11,496.71
2058	76	17,500.00	11,379.50
2059	77	17,500.00	11,263.49
2060	78	17,500.00	11,148.66
2061	79	17,500.00	11,035.00
2062	80	17,500.00	10,922.49
2063	81	17,500.00	10,811.14
2064	82	17,500.00	10,700.92
2065	83	17,500.00	10,591.82
2066	84	17,500.00	10,483.84
2067	85	17,500.00	10,376.96
2068	86	17,500.00	10,271.16
2069	87	17,500.00	10,166.45
2070	88	17,500.00	10,062.80
Total			407,212.60

Summary of Findings

Based on the information available at the present time, I have formed an opinion to a reasonable degree of economic certainty that Christina Corda will suffer a loss of pension benefits as a result of being terminated in September of 2014 that is equal to at least \$338,371. If one assumes a retirement benefit based on a statistical projection of her salary for the last three years she would have worked, the present value of her loss would equal approximately \$357,114. If one assumed that Ms. Corda would have received raises during her final three years sufficient to raise her average salary to \$70,000, the present value of her loss would equal approximately \$407,213. For every \$1,000.00 her pension increases, the present value of her damages increases by approximately 23,663.56.

This does not include any monetary loss for emotional distress or any other factors not specifically addressed in this report. Nor does it make any adjustment for the higher taxes that would be paid in the event that these damages are awarded in a single year and the marginal tax rate applied would be much greater.

This opinion is based on the information I have at this time. I reserve my right to supplement this opinion should any new information become available that would materially change the facts of the case.

As required by Federal Rule 26(b):

In forming my opinion in this matter I have relied upon the following information:

1. A copy of the Complaint filed in Suffolk Superior Court, March 3, 2015;
2. Deposition of Christina Corda, Vol I (7/10/15) and Vol II (8/21/15), With Exhibits.
3. Personnel file of Christina Corda covering her employment at the DA's Office;
4. Plaintiff's First, Second, and Third Document Productions, CC1 through CC1118;
5. Salary recommendations for Christina Corda for 2013 and 2014;
6. Personnel file from Bretta & Grimaldi for Christina Corda;
7. Plaintiff's Production of Documents, Pay and Benefits;
8. Pay Stubs and employer documents related to employee benefits for Christina Corda while employed at the DA's Office;
9. Information from the Plaintiff regarding the background of the claims in this case, the relative salaries of co-workers who were similarly situated, the details of her new job, and other personal background information;
10. Information from public published sources as footnoted in my report.

Attached is a copy of my current curriculum vitae (Appendix A).

I hereby state that I am being compensated as an expert in this case at the rate of \$200 per hour. I have spent approximately 7 hours up to this point on this case.

Attached is a copy of cases that I have testified in over the past four years and it is current as of this date (Appendix B).

SIGNED UNDER THE PAINS AND PENALTIES OF PERJURY ON THIS 1st DAY OF March, 2016.



Craig L. Moore, Ph.D.

EXHIBIT A

Curriculum Vitae

Craig L. Moore

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Education	B. S. Economics, West Virginia University, 1967; M. A. Economics, Maxwell School, Syracuse University, 1972; Ph.D. Economics and Statistics, Maxwell School, Syracuse University, 1972;
Present Positions	Private Management and Legal Consultant; Professor Emeritus, University of Massachusetts, Amherst;
Previous Positions	Professor at the Isenberg School of Management, University of Massachusetts, Amherst, 1972 through 2003; Director of the MBA Program, School of Management, 1978-1979; Special Assistant to the President of the University, 1979-1981; Special Assistant to the President of the University, 1997-2000; Senior Policy Advisor to the President of the University, 2000-2003; Chairman of the Department of Finance, September 1982 to August 1994; Named “University Professor of Political Economy” by the University of Massachusetts Board of Trustees, 1997; Founder and Editor of <i>Massachusetts Benchmarks</i> from 1997 to 2002. Chief Operating Officer of Marox Corporation, 2004 – 2007 Director, Regional Employment Board of Hampden County, Massachusetts; Director, MicroTest Corporation, Agawam, Massachusetts. Member of the Business Advisory Council of the Federal Reserve Bank of Boston, 2004 – 2010; Board of the Holyoke Medical Center and Valley Health, Inc. 2005-2010; Director, Forest Park Zoo, Springfield, Massachusetts.
Professional History	Joined University of Massachusetts Isenberg School of Management faculty as an Assistant Professor in 1972; Promoted to Associate Professor in 1976; Awarded Tenure in 1978; Promoted to Full Professor in 1980; Named “University Professor of Political Economy” in 1997; Retired from the University of Massachusetts December 31, 2003; Joined MAROX Corporation as Chief Operating Officer on January 1, 2004.
Teaching Experience	Financial Models – required for all finance majors; Statistical Tools for Management - required undergraduate course; Business Data Analysis – MBA Statistics requirement; Quantitative Methods II – Ph.D. Statistics requirement; Macro Economic Theory – Ph.D. requirement;

PUBLICATIONS

BOOKS AND MONOGRAPHS

Publications in this category include government publications reviewed by professional and academic economists before their publication.

Regional Economic Analysis for Community Development Planning, Massachusetts Department of Community Affairs, 119 pages, Oct. 1978.

Massachusetts Reconsidered: An Economic Anatomy of the Commonwealth, School of Management, University of Massachusetts, 148 pages, September, 1978.

“The Regional Industrial System” in *Spatial Analysis and the Industrial Environment* by F.I. Hamilton and G.J.R. Linge, London: John Wiley Ltd. (with Karaska and Susman), 1980.

The New Economic Reality, Massachusetts Prospects for Long-Term Growth; School of Management, University of Massachusetts, sponsored by the Massachusetts Taxpayers Foundation, 75 pages printed, May 1994 with Edward Moscovitch.

A Taxpayer’s Look at a Sacred Cow: Public Sector Design in Massachusetts Two Decades After the Ward Commission, 38 pages printed, November 1995 with Edward Moscovitch

Connection to the Future; An Analysis of the Telecommunications Industry in Massachusetts, published by the Massachusetts Telecommunications Council and the University of Massachusetts Economic Project, 45 pages printed, June 1, 1997.

The Effect of State Tax Policy on the Insurance Industry in Massachusetts, published by the Massachusetts Business Roundtable, 35 pages printed, October 1, 1997

The New Foundation; Information Technology, The Donahue Institute, University of Massachusetts, 18 pages printed, May 1999.

Science, Technology and Investment; The Cycle of Growth in Massachusetts, Massachusetts Department of Economic Development, 60 pages printed, August 2001.

Mathematical Models of a Regional Economy (in Russian), with Zhores I. Alferov (Nobel Prize in Physics 2000), published by the St. Petersburg State Technical University, summer of 2002, 85 pages printed.

Critical Transitions in Telecommunications: Shaping the New Economy, Massachusetts Telecommunications Council, November 2002, 60 pages, printed.

JOURNAL ARTICLES

- [1] "The Impact of Non-Profit Institutions on Regional Income, Syracuse University a Case in Point," *Growth and Change*, January 1974, Vol. 5, No. 2, pp. 36-40.
- [2] "A New Look at the Regional Trade Multiplier," *Northeast Regional Science Review*, Vol. III, 1973, pp. 164-170.
- [3] "The Impact of Non-Profit Institutions on Regional Income, Upstate Medical Center a Case in Point," *Economic Geography*, Vol. 50, No. 2, April 1974, pp. 124-129.
- [4] "Social Equity and Retained Earnings," *Rivista Internazionale di Scienze Economiche e Commerciali*, Ann. XXI, No. 2, 1974, pp. 137-135, with Sidney Sufrin.
- [5] "A New SYMAP for Viewing Spatial Location Patterns," *Selected Projects*, Graduate School of Design, Harvard University, Vol. VII, pp. 77-80, 1974.
- [6] "A National Planning Model for Petroleum Allocations," *Rivista Internazionale di Scienze Economiche e Commerciali*, Ann. XII, 1974, pp. 547-656.
- [7] "The Impact of a Non-Profit Institution on Regional Income: A Discussion," *Growth and Change*, Vol. 6, No. 3, July 1975, pp. 45-49.
- [8] "Computer Graphics and Decision Analysis," *Northeast Regional Science Review*, Vol. V, pp. 93-100, 1975, with Roger Calantone.
- [9] "A New Look at the Minimum Requirements Approach to Regional Economic Analysis," *Economic Geography*, Vol. 51, No. 4, October 1975, pp. 350-356.
- [10] "A Linear Programming Model for Determining an Optimal Regional Distribution of Petroleum Products," *Lecture Notes in Economics and Mathematical Systems*, No. 126, Energy, Regional Science and Public Policy, May 1975, pp. 119-135.
- [11] "Optimal Regional Distribution of Petroleum Products," *Omega*, Vol. 4, No. 3, 1976, pp. 301-311.
- [12] "A Bayesian Approach to Spatial Decision Models," *Northeast American Institute of Decision Sciences Proceedings*, May 1976, pp. 41-44.
- [13] "A Cross-Sectional Analysis of the Municipal Property Tax," *Northeast Regional Science Review*, Vol. 6, pp. 200-210.
- [14] "Modeling Interstate Shifts in Employment," *Northeast Regional Science Review*, Vol. 7, 1977, pp. 143-152.
- [15] "A Critical Review of Shift-Share Analysis as a Forecasting Technique," *Journal of Regional Science*, Vol. 20, No. 4, pp. 419-437.
- [16] "Banking and the Regional Income Multiplier," *Northeast Regional Science Review*, Vol. 9, 1979, pp. 1-7.
- [17] "Interregional Arbitrage and the Supply of Loanable Funds," *Journal of Regional Science*, Vol. 22, No. 4, 1982, pp. 499-512.
- [18] "Minimum Requirements and Required Economics, 1980," *Economic Geography*, Vol. 60, No. 3, July, 1984.
- [19] "The Impact of the Banking System on Regional Analysis," *Regional Studies*, Vol. 19.1, pp. 29-35, 1984.

- [20] "A General Equilibrium Model of Interregional Monetary Flows," *Environment and Planning A*, Vol. 21, pp. 397-404, 1989.
- [21] "Utilizing an Economist to Establish Damages Through Expert Testimony, " *Journal of the Massachusetts Academy of Trial Attorneys*", Vol. 4, No. 2, pp. 7-10, May 1996.
- [22] "Benchmarking – An American Perspective," *Economia & Perspectiva*, No. 15/16, Jan./June, 2001, pp.201 – 211, 2001.

PUBLISHED CASE STUDIES

The following case studies were gathered and written during the summer of 1973 under a grant from the Center for Business and Economic Research and were subsequently published by the Harvard Case Clearing House, and in the book cited below:

<u>Case Title</u>	<u>Publication Number</u>
Jacobsen Rug Company	9-375-813
Jacobsen Teaching Note	8-375-814
Magnavox CATV	9-375-815
Magnavox Teaching Note	8-375-815
Cherry House Furniture	9-375-825
Cherry House Furniture [A]	9-375-826
Cherry House Teaching Note	8-375-827

Baird, Bruce F., *Introduction to Decision Analysis*, 1978 pp. 506-508, Duxbury; Jacobsen Rug Company, Cherry House Furniture [A], Cherry House Furniture Teaching Note.

BOOK REVIEWS

"The Changing Role of Public Administration," A review of three books and a discussion of how they illustrate the new demand on public administrators. *Management Research*, Vol. 8, No. 3, 1975, page 51.

Waste Paper Recovery: Economic Aspects and Environmental Impacts, reviewed in the *Annals of Regional Science*, 1982.

Economic Geography by James Wheeler and Peter Muller, reviewed in the *Annals of Regional Science*, 1983.

OTHER PUBLICATIONS

Designing an Administrative Control System for MEPA: Massachusetts Environmental Policy Act, Institute for Man and the Environment and The Executive Office of Environmental Affairs, 130 pages, August 1975, with Richard Smardon.

“A New Technique for Estimating Municipal Property Tax Base,” Proceedings of the New England Business and Economic Development Conference, University of New Hampshire, 1974 with Richard Evans.

A Long Range Systems Development Guide for Transportation Planning in the Commonwealth of Massachusetts, July 1975, DPW-UMASS. Joint Transportation Program, Contract 17618, 55 pages.

Computer Assisted Analysis of Geographical Information for Transportation Planning, May 1975, DPW/UMASS. Joint Transportation Program, Contract 17618, 31 pages.

An Economic Base Analysis of the Fitchburg-Leominster Region, May 1975, DPW/UMASS. Joint Transportation Program, Contract 17618, 40 pages.

“Welfare Serendipity,” editorial page, *New York Times*, July 17, 1975, p. 28, with Joel Morse.

A Planned Program Budget System, The Legislative Research Council, Commonwealth of Massachusetts, 65 pages, June 1976, with George Odiorne.

Economic Development Program - Town of Wareham, September 1976, Office of Economic Development, Town of Wareham, 152 pages.

Economic Analysis of the Proposed Park Plaza Urban Renewal Project, Center for Community Renewal Studies and the Department of Community Affairs, June 1976, 78 pages.

A Management System for Financial Administration, The City of Northampton, September 1976, 84 pages, bound.

The Economic Development Potential of 121B, Massachusetts Department of Community Affairs, 64 pages, July 1977, with Tom Nutt-Powell at M.I.T.

New Bedford - Fairhaven Route 6 Corridor Planning Study, Southeastern Regional Planning and Economic Development District, February 1977, three volumes, 272 pages bound.

Tapping Local Business Talent for Community Development Planning, *Management Research*, Vol. 10, #4, July/August 1977.

Market Analysis of Retail and Commercial Trade in Downtown Holyoke. City of Holyoke, Holyoke Redevelopment Authority, April 1977, 45 pages, with Jack Wolf.

Marketing Industrial Space, Department of Community Affairs Commonwealth of Massachusetts, August 1978, 114 pages, bound.

Attitudes Toward Flood Management in Northampton, Massachusetts; New England Division, U.S. Army Corps of Engineers, Waltham, MA, November 1978, 173 pages, bound, with Alice Carlozzi, James Palmer, Carl Carlozzi, & Arthur Elkins.

Economic Analysis of the Pioneer Valley, Pioneer Valley Association, January 1979, 66 pages, printed and bound.

New Bedford State Pier; Economics and Marketing Study, Department of Environmental Quality Engineering, Division of Waterways, Commonwealth of Massachusetts, March 1979

PAPERS PRESENTED (a partial list)

“A Linear Programming Model for Determining an Optimal Distribution of Petroleum Products,” presented at the ORSA-TIMS Meetings in San Juan, Puerto Rico, 1974.

“A Linear Programming Model for Optimal Regional Distribution of Petroleum Products in the U.S.,” International Conference on Energy and the Environment, Leuven, Belgium, May 1975.

“A Bayesian Approach to Spatial Decision Models,” presented at the Northeast AIDS Meetings, Philadelphia, PA., 1975.

“Modeling Interstate Shifts in Employment,” presented at the Northeast Regional Science Meetings, Halifax, Nova Scotia, 1977.

“Banking and the Regional Income Multiplier,” Presidential Address, Northeast Regional Science Meetings, Amherst, May 1979.

“Commercial Banking and Regional Growth,” presented at the Eastern Economics Association Meetings, Boston, Mass, May 1979.

“Banking and the Regional Income Multiplier,” invited paper presented at the National Regional Science Meetings, Los Angeles, California, November 1979.

“The Impact of Energy Price Increases on Consumer Expenditures,” invited paper presented to the National Energy Policy Conference, West Virginia University, Morgantown, W. VA., May 1980.

“The Regional Industrial System,” presented to the International Geographical Union Commission on Industrial Systems, Tokyo, Japan, August 1980.

“Interregional Arbitrage and the Supply of Loanable Funds” presented to the Northeast Regional Science Meetings, Rutgers University, May 1981.

“Interregional Arbitrage and the Supply of Loanable Funds” invited paper presented to the North American Regional Science Association, Montreal, Canada, November 1981.

“Toward a Systems Approach to Regional Analysis,” invited paper presented at the International Congress of Arts and Sciences, Rotterdam Holland, June 1984.

“A General Equilibrium Model of Interregional Monetary Flows,” invited paper presented at the National Conference of Modeling and Simulation, Pittsburgh, April 1986.

“The Post Industrial Challenge to Location Theory,” presented at the Northeast Regional Science Association meetings in Buffalo, N. Y., May 1990.

“The Application of Real Time Statistical Software to Developing Econometric Models,” Umea University, Uppsala University and Lund University, Sweden, October 1990.

“An Empirical Comparison of Diversification Indices,” The International Regional Science Meetings, New Orleans, LA, November 1991.

“Establishing an Entrepreneurial Base for Economic Transition,” Jagellonia University, Cracow, Poland, January 1992.

“The Benefits of Economic and Academic Interaction in Supporting Peace Efforts in Northern Ireland”, Ulster University, Londonderry, Northern Ireland, June 1995.

“Prospects for the Economic Monetary Union; an American Perspective”, Keynote address, 20th anniversary symposium, Haarlem International School of Business, Haarlem, Netherlands, November 2, 1998.

“A Russian Economic Strategy in the Global Economy”, presented at the Saint Petersburg State Technical University in Pskov, Russia 23rd, 2001.

“New Approaches to Economic Analysis in a Knowledge Based Economy”, National Association of State Development Agencies, National Research Meetings, Saratoga Springs, July 23, 2001.

“The New Economy and the Law”, Proceedings of The Massachusetts Bar Association Annual Conference, Boston, Massachusetts, January 26, 2002, pp 1-4.

“Using Statistics in Employment Cases”, Proceeding of the Employment Law Conference, Mass. Continuing Legal Education, December 6, 2002, Boston, pp. 157-168.

“A Look at the Northeast Ohio Nursing Workforce”, Driving the Future in Today’s Uncertain Healthcare Environment, Kent State University, March 7, 2011.

PROFESSIONAL ACTIVITIES AND HONORS

President of the Northeast Regional Science Association: 1975-1976, 1978-1979, 1990-1991.

Associate Editor of the Regional Science Review, 1975, 1991.

Who's Who in Computer Graphics, 1985.

Named as a Fellow of the Institute for Man and the Environment, 1976-1977.

Visiting scholar at Umea, Uppsala and Lund Universities in Sweden during the fall of 1990. Worked with Tona Pu (Nobel Prize in Mathematics) on the application of Chaos Theory to Regional Economic Growth.

Grant to establish the first postgraduate business program in Poland at the Jagellonia University in Cracow supported by the Mellon Foundation and the U. S. Information Agency, 1992-1994.

School of Management Faculty Service Award, 1994

Recipient of the Chancellor's University Advancement Award, 1995

Accompanied Governor William Weld on a mission to Ireland and Northern Ireland, March 1997.

Named as a University Professor of Political Economy by the Board of Trustees of the University of Massachusetts, June 1997.

Named “Professor of the Year” by the Massachusetts Telecommunications Council, March 1999.

Organized the International Conference on Economies Emerging from Conflict, University of Ulster, with John Hume (Nobel Peace Prize), Londonderry, Northern Ireland, June 23 - 25, 1999.

Appointed to the New England Business Advisory Council that advises the Federal Reserve Bank of Boston on business and economic policy, 2004 – 20010.

Funded by the Robert Wood Johnson Foundation and the Davis Foundation to model the Nurse Workforce for Western Massachusetts, 2008-2009.

Funded by the Massachusetts Department of Higher Education to develop a policy model for nursing education and the nurse workforce, 2009.

Funded by the Robert Wood Johnson Foundation and the Northeast Ohio Nursing Initiative to model the future of the nursing workforce in Northeast Ohio, 2010-2011.

Legal Expertise and Consulting

I began working as an expert witness in 1972 and testified for both plaintiffs and defendants in a variety of cases including wrongful death, personal injury, medical malpractice, and business disputes involving the valuation of companies or assets. I have testified in Federal District Court in Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, Maine, and North

Carolina. I have testified in superior court in Massachusetts, Connecticut, Vermont, New Hampshire, and New York. I have been retained by law firms in cases in California, Arizona, Florida, New Jersey, South Carolina, Ohio, Illinois, Oregon, Nebraska, Kentucky, Tennessee, Mississippi, Oklahoma, and Indiana.

Employment - I have testified as an economist and as a statistician in race, gender, handicap, and age discrimination cases related to termination, promotion and hiring under Title VII and the Age Discrimination in Employment Act of 1967. I have testified in high profile employment cases including Biggins v. Hazen Paper Co. et al. and Halligan et al. v. Ground Round, Inc. More recently in Hadad v. WalMart, McPadden v. WalMart, and Trainor v. HEI, Inc. that received press attention.

Wrongful Death - I was heavily involved in preparing over 100 economic damage estimates for the families of victims killed in the World Trade Center on September 11, 2001 for Kenneth Feinberg, Special Magistrate of the Victims' Compensation Fund.

I have been regularly invited to lecture in programs conducted by Massachusetts Continuing Legal Education concerning statistical evidence and economic damages:

Age Discrimination, Boston, June 11, 1992.

Personal Injury Damages, Boston, March 11, 1993.

Personal Injury Damages, Boston, July 20, 1994.

Advanced Trial Advocacy Workshop, Boston, August 4, 1994.

Personal Injury Damages, Boston, February 1996.

Advanced Trial Advocacy Workshop, Boston, August 14, 1997.

Trying Employment Cases in the Superior Court, Springfield, April 7, 1999.

Trying Employment Law Cases in the Superior Court, Boston, April 13, 1999.

Annual Employment Law Conference, Boston, December 5, 2002

I have also been invited to lecture by other organizations that include:

The Massachusetts Chapter of the National Employment Lawyers Association; "Statistical Evidence in Employment Discrimination; The Trend Toward Multivariate Methods", Boston, April 27, 1995.

National Employment Lawyers Association, "Statistical Evidence in Employment Discrimination; The Trend Toward Multivariate Methods", Proceedings of the National Employment Lawyers Association, Vol. I., pp.444-454, San Diego, June 27, 1996.

Massachusetts Bar Association, Committee on Employee Rights, Boston, February 7, 2000.

Western New England Law School on several occasions over the past few years.

"The New Economy and the Law", The Massachusetts Bar Association 2002 Annual Conference on January 26th, 2002, published in the proceedings, pp 1-4.

Annual District Court Judges Conference, Southbridge, Massachusetts, May 29, 2003.

7th Annual Conference of the National Employment Lawyers Association, Boston, May 16, 2011.

I was an elected member of the Board of Overseers of the Historical Society of the Supreme Judicial Court of Massachusetts for two 3 year terms, 2000 - 2006.

In addition to legal work, I also regularly consult with government leaders, public agencies, non-profit organizations, and business firms on a wide range of management, financial, and public policy issues. I conducted funded research modeling the nurse workforce in Massachusetts, Ohio, Louisiana, Florida, Idaho, and currently in Maine and have served as a consultant to HRSA.

Service to the Commonwealth of Massachusetts

- Department of Community Affairs: economic feasibility study of the Park Plaza Redevelopment Project, reviewed 21 urban renewal projects, and the prepared handbooks concerning the economic development of communities, 1975-1978.
- Chairman of the Task Force on Policy Issues, Northeast Council for Economic Action, sponsored by the Bank of Boston and the Economic Development Admin.; 1977 - 1978.

- Addressed the leadership of the Massachusetts House of Representatives regarding state economic policy, State House, Boston, July 29, 1994.
- Advised the Massachusetts House Committee on Taxation on tax policy and its impact on business development, July 11, 1995
- Invited to testify before the joint session of the Massachusetts House and Senate Taxation Committee on Governor Weld's proposed tax legislation, October 5, 1995.
- Worked with the Mass. Business Roundtable to support pending tax legislation for the mutual funds industry in the Massachusetts Senate, July 1996.
- Invited to testify before a joint session of the Massachusetts House and Senate Technology Committees on the Telecommunications Industry in Massachusetts, February 5, 1997.
- Worked with the Mass. Business Roundtable to present information and analysis concerning pending tax reform legislation in the insurance industry during 1997 and 1998.
- Invited to testify before a joint session of the Massachusetts House and Senate Ways and Means Committees concerning the economy and tax revenues, March 1998, 1999, 2000, and 2001.
- Member of the Massachusetts Labor Market Information Advisory Subcommittee established by the Department of Employment and Training and the Massachusetts Jobs Council, 1999-2003.

Service to the University of Massachusetts

- Member of the Faculty Senate, 1973-1974, 2000 – present.
- University Computer Services Committee, 1972-1976, 1978-1979, Chair 1974-1976.
- University Management Systems Advisory Committee, 1974-1976.
- Faculty Research Selection Committee, 1975.
- Member of the Advisory Board of Orchard Hill Residential College, 1974-1977.
- Member of the Campus Center Director Search Committee, 1977.
- Member of the Title IX Salary Review Committee, 1977-78.
- Member of the Graduate Council, 1978.
- Member of the Committee on Academic Priorities, 1978-1980 (Chair, 1978-1979), 2000 to present.
- Special Assistant to the President of the University of Massachusetts, 1979-1981.
- Member of the University Personnel Policies Committee, Chairman, 1988-89.
- Member of the Committee to Advise the Provost on Budget Priorities, 1991.
- Chairman of the Committee on Statistical Pedagogy, 1994-1996
- Member of the Public Policy Planning Council 1996-1997
- Special Assistant to the President of the University of Massachusetts, 1997-2001
- Member of the Program and Budget Council 2000 – 2003, Chair 2000-2002

Service to the Isenberg School of Management

- Curriculum Committees' Task Force on Quantitative Studies, 1972-1973.
- Economics Ph.D. Qualifying Examination Committee, 1973-1977, Chair 1974-1977.
- Member of the Graduate Studies Committee, 1972-1975.
- Director of the Graduate Public Management Program, 1973-1977.
- Chairman of the Department Personnel Committee 1978-1979, 1981-1982, 1996-1997.
- Member of the Task Force on Research Policy, 1977.
- Director of Masters Program, 1978-1979.
- Member of Academic Policy Committee, 1981-1982.
- Member of Administrative Committee, 1978-1979, 1982 -1994.
- Quantitative Methods Ph.D. Qualifying Examination Committee, Chair 1990-1992.
- Member of the committee to design the school's computer facilities, 1991.
- Chair of the MBA Task Force to Establish a Professional MBA Program, 1991-1992.
- Chairman of the Department of Finance and Operations Management 1982-1994.
- Chairman of the search committee for the Isenberg Chair in Integrative Studies 2000-2001

EXHIBIT B

Rule26

<i>Trial Date Court</i>	<i>Client</i>	<i>Plaintiff</i>	<i>Defendant</i>
3/17/2010 Hampden Probate	Dowd	Tammy L. Dowd	Dwayne J. Dowd
3/25/2010 Federal Court, Springfield	Berkshire Blanket	Berkshire Blanket, Inc.	Intedpendent Computer Consulting, Inc.
5/5/2010 Worcester Superior	Shea	Thomas Shea	Central Water District/Cedar Meadow
6/14/2010 Worcester Superior	Jolicoeur	Rene Jolicoeur	J.R. Bonner Plastering
7/28/2010 U.S. District Court	Brooks	Estate of Jason Houran	Specialty Minerals, et al
9/1/2010 Bristol Superior	One Beacon	Karen Balmforth	Edmond & Lisa Piscone
9/13/2010 Federal Court Boston	Hatch	Dean Hatch	Trail King Industries, Inc.
9/20/2010 Suffolk Superior	Pointer	Bernard Pointer	Castellani, et al
9/30/2010 U.S. District Court	Golden	Art Bundy, Derivativey	Michael Golden, et al
10/12/2010 Worcester Superior	Yacino	Brian Yacino	Rosemarie Peloquin et al
10/22/2010 Berkshire Superior	Selke	Whitney Selke	Anne Selke
10/27/2010 Hampden Superior	Hernandez	Framisco Hernandez	C&S Wholesale Groceries, Inc.
11/10/2010 Hampden Superior	Velasquez	Doralba Velasquez	BayState Medical Center
1/14/2011 Hampden Superior	Shattuck	Linda and Robert Shattuck	The Coca-Cola Company
3/10/2011 U.S. District Court	Ara	Sayada Jesmin Ara	Tedeschi Food Shop, Inc.
3/25/2011 Rockingham Superior NH	Ekstrom	Michelle Ekstrom	Wal-Mart
3/29/2011 Federal Court, Boston	Trainor	Lawrence Trainor	HEI Resorts, Inc.
3/31/2011 Arbitration	Pease	John and Jane Pease	William Slysz

6/20/2011 Worcester Superior	Garshman	Howard Garshman	Commonwealth Bank
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Friday, February 19, 2016

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<i>Trial Date</i>	<i>Court</i>	<i>Client</i>	<i>Plaintiff</i>	<i>Defendant</i>
10/17/2011	Federal Court, Concord, New Hampshire	Young & Novis	Wentworth-Douglass Hospital	Young & Novis, PA; et al
11/2/2011	Suffolk Superior	Kiely	Deborah Kiely	Teradyne, Inc.
2/28/2012	U.S. District Court - Massachusetts	Stream, Vincent, Schepp	United States	Jeffery Steam, et al
5/16/2012	U.S. District Court Northern New York	Estes	Nancy Estes, et al	Tejinder Singh, M.D. et al
6/5/2012	Hampshire Superior	Churchill	Gary and Zina Churchill	All Granite and Marble, Inc. et al.
6/21/2012	Norfolk Superior	Zarhar	Alfred Zarhar	CF Realty Trust et al.
7/26/2012	Rockingham Superior NH	Coellner	Estate of Seth Coellner	Rusell Hilliard
8/1/2012	Worcester Superior	Peabody	Everett Peabody	Robert J. Doiran, et al
10/3/2012	Roy		Lucien and Madeline Roy	Tracey Allen, Scarfo Construction, Curt Gezotis,
10/3/2012	Hillsborough Superior, New Hampshire	Roy	Estate of Madeleine Roy, et al	Dr. Christine Cochrane
10/4/2012	U.S. District Court - Massachusetts	Forsythe	Russell Forsythe	Primesource Building Products, Inc.
10/25/2012	Grafton County Superior - NH	McKee	Heidi McKee	NGS Dental
11/6/2012	Middlesex Superior	Haraden	Patricia Haraden	Verizon New England, Inc., et al
11/9/2012	Rockingham Superior - NH	Jodoin	Noel Jodoin and Adam Jodoin	Ellen Gerety, M.D. et al
4/16/2013	U.S. District Court - Massachusetts	Larkins	Guy Larkins	City of Springfield, et al
6/3/2013	U.S. District Court - Manhattan	Young	Estate of Ricardo Young	Moran Towing Corp. et al.

10/22/2013 U.S. District Court - Massachusetts	Ray	John H. Ray, III	Ropes and Gray et al
12/5/2013 Norfolk Superior	Galter	Wilson Galter	Associated Consultants
12/17/2013 Middlesex Superior	Stefflin	Joseph Stefflin	Pinncon, Inc. et al.
1/22/2014 Hampshire Superior	Karpells	Estate of Stephen Karpells	David Longworth, M.D., et al.
1/29/2014 Franklin Superior	Chapin	Edward Chapin	Facey, et al

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<i>Trial Date</i>	<i>Court</i>	<i>Client</i>	<i>Plaintiff</i>	<i>Defendant</i>
2/14/2014 U.S. District Court - Connecticut		Proulx	Paul Proulx	International Paper Company
8/5/2014 Stanford CT.		Randall	Catherine Randall	Mattern
12/3/2014 Middlesex Superior		Schultz	Lyn A. Schultz	Unisphere Travel, Ltd, d/b/a/ Colpits
12/5/2014 U.S. Federal Court - Worcester		Johnston	Tamara and Archibald Johnston	ZBA of Berlin
12/16/2014 U.S. District Court - Western Mass.		West	Estate of Russell West	FirstLight Power Resources, Inc. et al
2/13/2015 Hampden Probate		Pighetti	Kristen Pighetti	Kevin Pigetti (client)
2/23/2015 U.S. District Court - Massachusetts		Belghiti	Mokhtar Sidel Belghiti	Select Restraunts, The Hub
7/17/2015 U.S. District Court - Boston		Shea	Beth Shea	Bradford Porter
8/21/2015 Hampden superior		Gray	Karen Gray	Laurel Ferrera
9/17/2015 Hampden Family Probate Court		Mohamed	Mohamed	Abbass
9/29/2015 Hampden Probate Court		Tereso	Eva Tereso	Gary Tereso
1/12/2016		Applegate	Estate of Brian Applegate	Barbara Woffprd, APRN et a;

Kenton Circuit Court, Kentucky

1/26/2016 McPadden
U.S. District Court - New Hampshire

Maureen McPadden

Walmart

2/9/2016 Dubuque
Hampden Superior

Todd Dubque, Lisa Dubque, and
Leo Dubquee

Mark Arcott, Joanne Arcott,
Chicopee MSB, Inc. et

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